

## Features

- High Efficiency (Up to 91%)
- Active Power Factor Correction (0.95 Typical)
- Constant Current Output
- Lightning Protection
- Dimming Function
- All-Round Protection: OVP, SCP, OTP
- Waterproof (IP67) and Damp & Wet Location



## Description

The ESC-150SxxxDT(ST) series operate from a 249 ~ 528 Vac input range. They are designed to be highly efficient and highly reliable. Features include dimming control, over voltage protection, short circuit protection and over temperature protection.

## Models

Output Current (1)	Input Voltage Range	Output Voltage Range	Max. Output Power	Typical Efficiency (2)	Power Factor		Model Name (3)
					277Vac	480Vac	
580 mA	249 ~ 528 Vac	129~257Vdc	150 W	91%	0.95	0.90	ESC-150S058DT(ST)
700 mA	249 ~ 528 Vac	107~214Vdc	150 W	91%	0.95	0.90	ESC-150S070DT(ST)
1050 mA	249 ~ 528 Vac	71~142Vdc	150 W	90%	0.95	0.90	ESC-150S105DT(ST)
1400 mA	249 ~ 528 Vac	53~107Vdc	150 W	90%	0.95	0.90	ESC-150S140DT(ST)
2100 mA	249 ~ 528 Vac	35~71 Vdc	150 W	90%	0.95	0.90	ESC-150S210DT(ST)
2800 mA	249 ~ 528 Vac	27~54 Vdc	150 W	90%	0.95	0.90	ESC-150S280DT(ST)
3500 mA	249 ~ 528 Vac	21~43 Vdc	150 W	89%	0.95	0.90	ESC-150S350DT(ST)
4200 mA	249 ~ 528 Vac	18~36 Vdc	150 W	89%	0.95	0.90	ESC-150S420DT(ST)

- Notes:** (1) The output current is adjustable at factory from 50% to 100%.  
 (2) Measured at full load and 277 Vac input.  
 (3) A suffix -xxxx may be added to denote variations or modifications to the base product, where x can be any alphanumeric character or blank.

## Input Specifications

Parameter	Min.	Typ.	Max.	Notes
Input Voltage	249 V	-	528 V	
Input Frequency	47 Hz	-	63 Hz	
Leakage Current	-	-	1 mA	At 480Vac 60Hz input
Input AC Current	-	-	0.7 A	Measured at full load and 277 Vac input.
	-	-	0.42 A	Measured at full load and 480 Vac input.
Inrush Current	-	-	50 A	At 480Vac input, 25°C cold start, duration=400 μs, 10%Ipk-10%Ipk.
Inrush Current(I <sup>2</sup> t)	-	-	0.35 A <sup>2</sup> s	

Specifications are subject to changes without notice.

## Input Specifications (Continued)

Parameter	Min.	Typ.	Max.	Notes
Power Factor	0.94	0.95	-	Measured at full load and 277 Vac
	0.88	0.90	-	Measured at full load and 480 Vac

## Output Specifications

Parameter	Min.	Typ.	Max.	Notes
Output Current Range	-5%		5%	
Output Voltage at No Load				
$I_o = 580$ mA	-	-	270 V	
$I_o = 700$ mA	-	-	225 V	
$I_o = 1050$ mA	-	-	155 V	
$I_o = 1400$ mA	-	-	120 V	
$I_o = 2100$ mA	-	-	85 V	
$I_o = 2800$ mA	-	-	65 V	
$I_o = 3500$ mA	-	-	50 V	
$I_o = 4200$ mA	-	-	42 V	
Output Overshoot / Undershoot	-	-	10%	When power on or off.
Line Regulation	-	-	$\pm 1\%$	
Load Regulation	-	-	$\pm 3\%$	
Turn-on Delay Time	-	-	3.0 s	Measured at 277Vac input.
	-	-	3.0 s	Measured at 480Vac input.
Temperature coefficient	-	-	0.03%/°C	Case temperature = 0°C ~Tc max

**Note:** All specifications are typical at 25 °C unless otherwise stated.

## Protection Functions

Parameter	Min.	Typ.	Max.	Notes
Over Temperature Protection-Tc	-	110 °C	-	Auto-recovery. The power supply shall return to normal operation only after the temperature return to normal.
Short Circuit Protection	No damage shall occur when any output operating in a short circuit condition.			

## General Specifications

Parameter	Min.	Typ.	Max.	Notes	
Efficiency	$I_o = 580$ mA	89%	90%	-	Measured at full load, 480Vac input, 25°C ambient temperature, after the unit is thermally stabilized. It will be about 1% lower, if measured immediately after startup.
	$I_o = 700$ mA	89%	90%	-	
	$I_o = 1050$ mA	88%	89%	-	
	$I_o = 1400$ mA	88%	89%	-	
	$I_o = 2100$ mA	88%	89%	-	
	$I_o = 2800$ mA	88%	89%	-	
	$I_o = 3500$ mA	87%	88%	-	
	$I_o = 4200$ mA	87%	88%	-	

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## General Specifications (Continued)

Parameter	Min.	Typ.	Max.	Notes
Efficiency I <sub>o</sub> = 580 mA I <sub>o</sub> = 700 mA I <sub>o</sub> = 1050 mA I <sub>o</sub> = 1400 mA I <sub>o</sub> = 2100 mA I <sub>o</sub> = 2800 mA I <sub>o</sub> = 3500 mA I <sub>o</sub> = 4200 mA	90% 90% 89% 89% 89% 89% 88% 88%	91% 91% 90% 90% 90% 90% 89% 89%	- - - - - - - -	Measured at full load, 277Vac input, 25°C ambient temperature, after the unit is thermally stabilized.  It will be about 1% lower, if measured immediately after startup.
MTBF		259,800 hours		Measured at 480Vac input, 80%Load and 25°C ambient temperature (MIL-HDBK-217F)
Life Time		140,000 hours		Measured at 480Vac input, 80% load; Case temperature=60°C @ T <sub>c</sub> point. See life time vs. T <sub>c</sub> curve for the details
Case temperature			85°C	
Dimensions Inches (L × W × H) Millimeters (L × W × H)		7.40 × 3.70 × 1.71 188 × 93.9 × 43.5		
Net Weight	-	1300 g	-	

**Note:** All specifications are typical at 25 °C unless otherwise stated.

## Environmental Specifications

Parameter	Min.	Typ.	Max.	Notes
Operating Temperature	-35 °C	-	+65 °C	Humidity: 10% RH to 100% RH See Derating Curve for more details
Storage Temperature	-40 °C	-	+85 °C	Humidity: 5% RH to 100% RH

## Safety & EMC Compliance

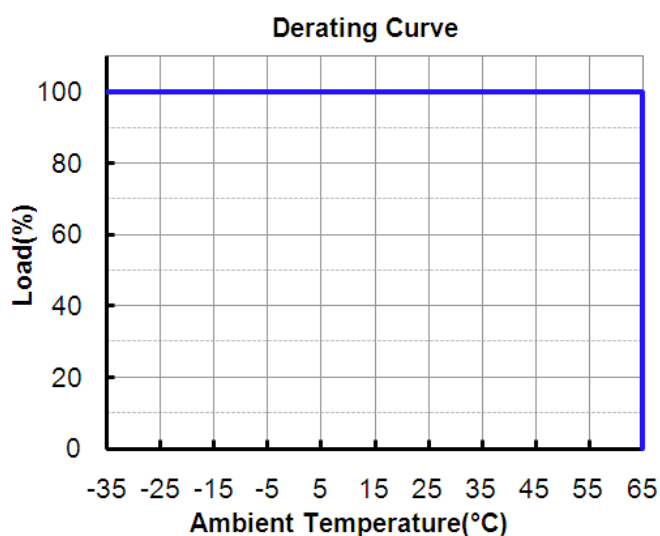
Safety Category	Standard
UL/CUL	UL8750, UL1012, CAN/CSA-C22.2 No. 223-M91, CSA-C22.2 No. 107.1-01,
CE	EN 61347-1,EN61347-2-13
EMI Standards	Notes
EN 55015	Conducted emission Test & Radiated emission Test
FCC Part15	ANSI C63.4:2009 Class B
EMS Standards	Notes
EN 61000-4-2	Electrostatic Discharge (ESD): 8 kV air discharge, 4 kV contact discharge
EN 61000-4-3	Radio-Frequency Electromagnetic Field Susceptibility Test-RS
EN 61000-4-4	Electrical Fast Transient / Burst-EFT
EN 61000-4-5	Surge Immunity Test: AC Power Line: line to line 4 kV, line to earth 6 kV

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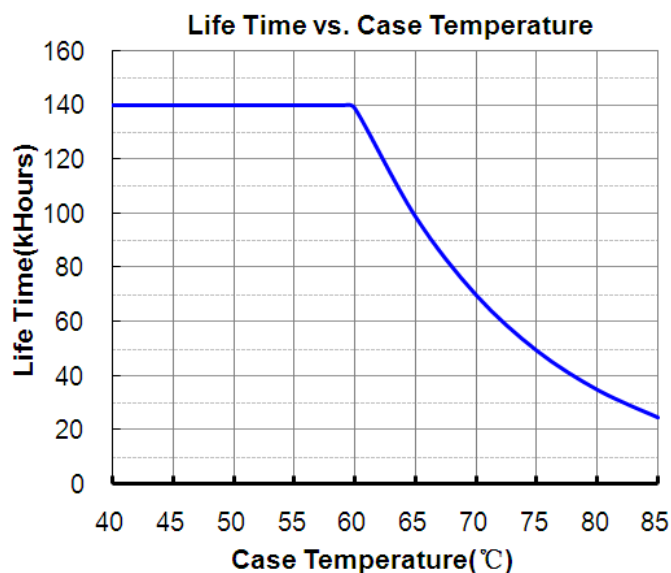
## Safety & EMC Compliance (Continued)

EMS Standards	Notes
EN 61000-4-6	Conducted Radio Frequency Disturbances Test-CS
EN 61000-4-8	Power Frequency Magnetic Field Test
EN 61000-4-11	Voltage Dips

## Derating Curve

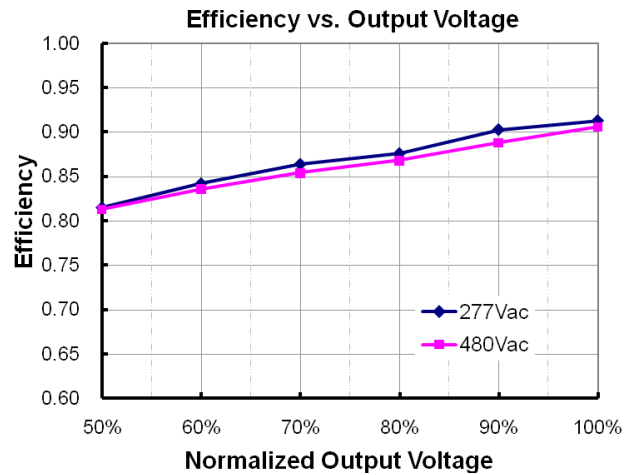
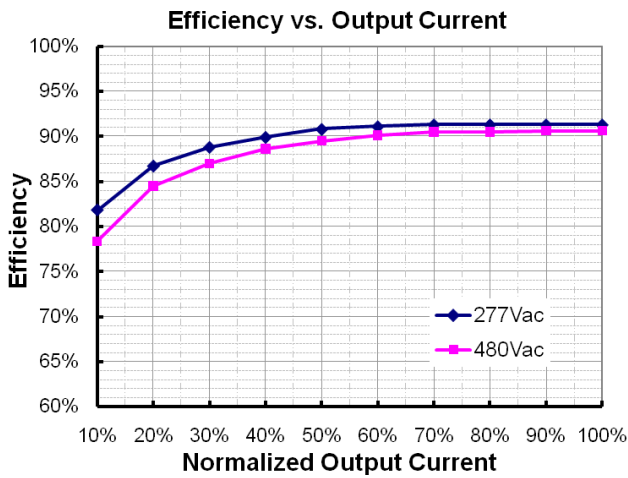


## Life Time vs Case Temperature Curve

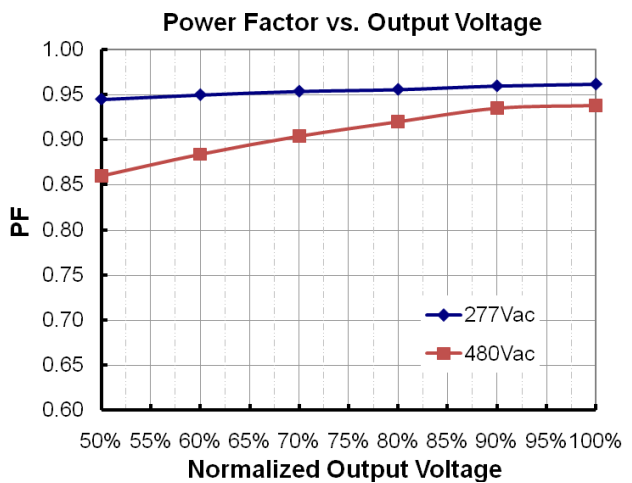
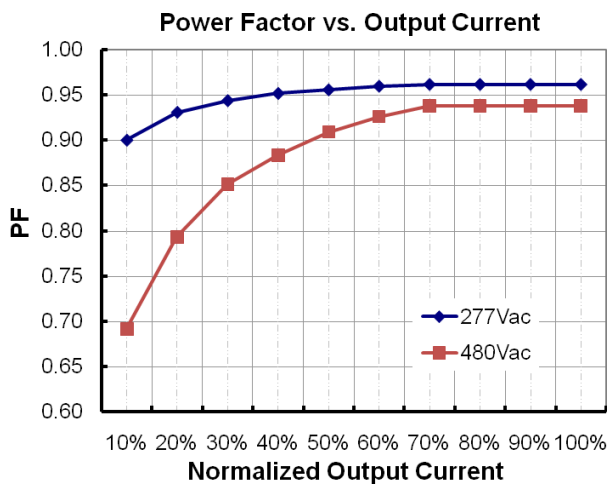


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## Efficiency vs Load (580mA Model)



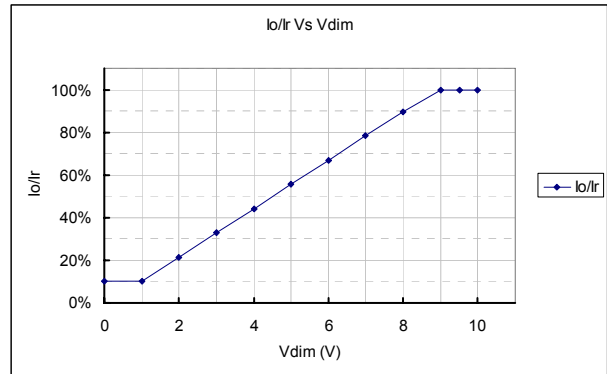
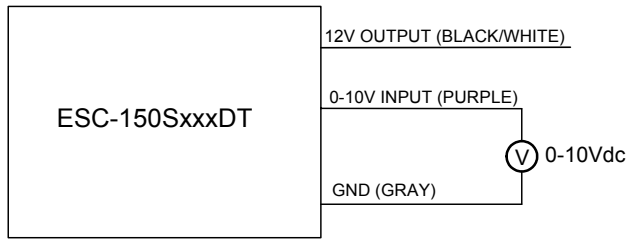
## Power Factor Characteristics



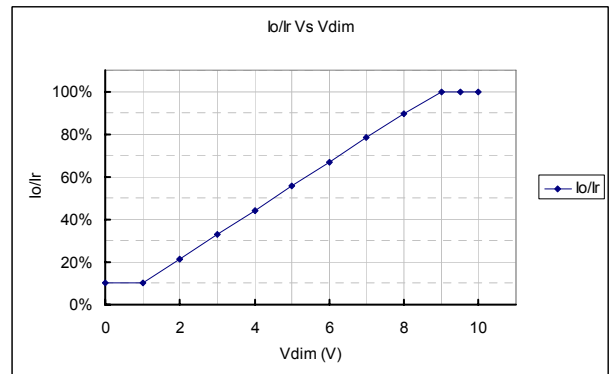
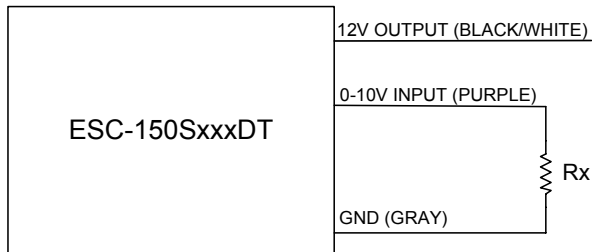
## Dimming Control (On secondary side)

Parameter	Min.	Typ.	Max.	Notes
12V output voltage	10.8 V	12 V	13.2 V	
12V output source current	0 mA	-	20 mA	
Absolute maximum voltage on the 0~10V input pin	-2 V	-	15 V	
Source current on 0~10V input pin	-	200 uA	-	

The dimmer control is operated from an input signal of 1 – 10 Vdc. Recommended implementations are provided below.



Implementation 1: DC input



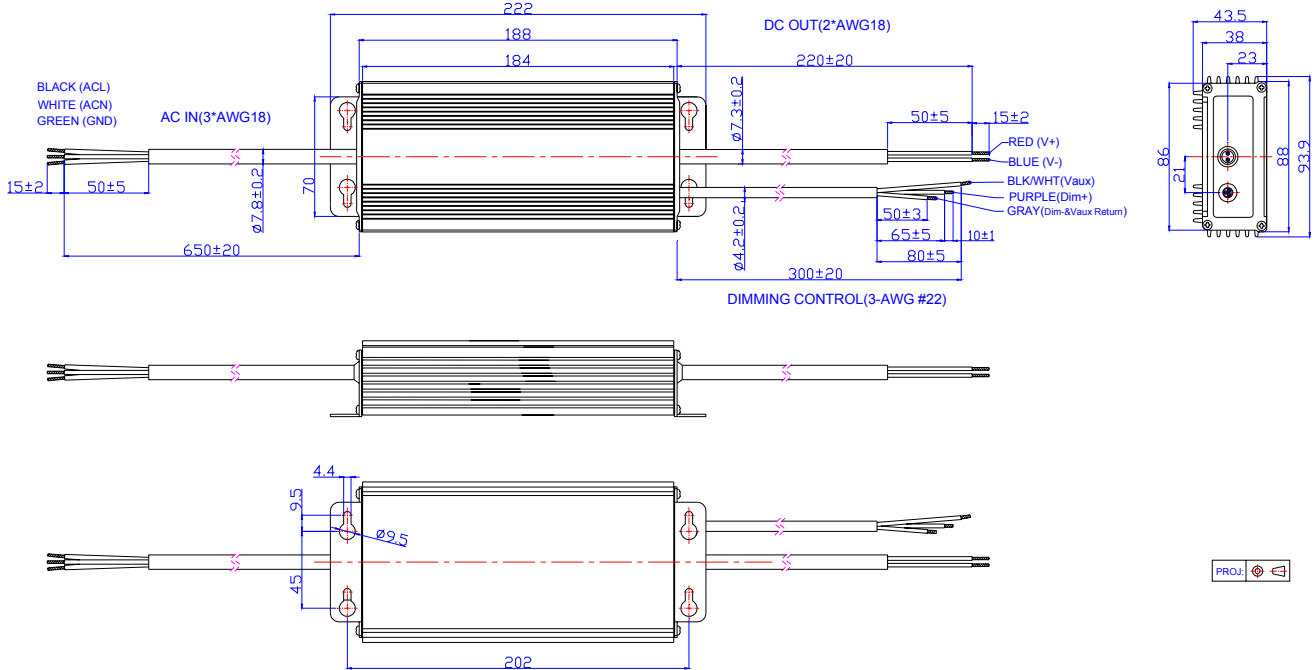
Implementation 2: External resistor

**Notes:**

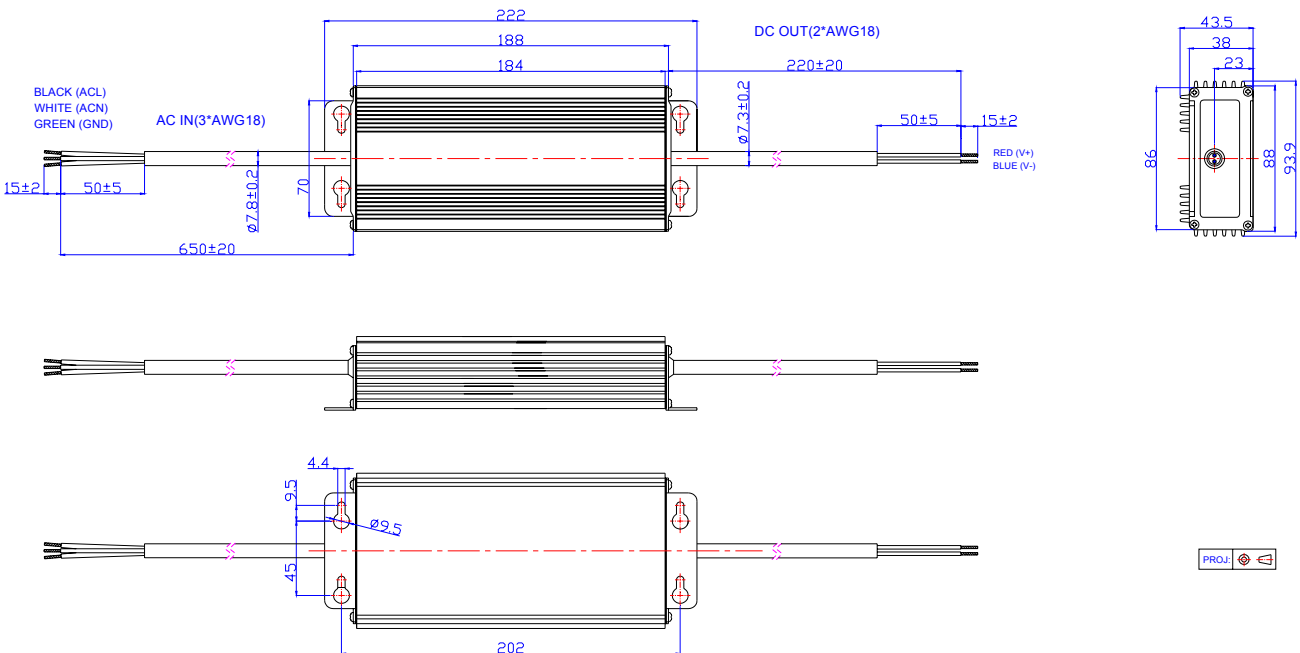
1.  $I_o$  is actual output current and  $I_r$  is rated current without dimming control.
2. For the driver to operate properly, the load voltage must be maintained above the minimum voltage threshold (approx. 50% of the max. output voltage for any given model).
3. If the output voltage is maintained above 50% of the maximum output voltage, the dimming control may be operated over the entire 1-10V range with output current varying from 10% to 100% of  $I_r$ .
4. The dimming signal is allowed to be less than 1V, however, when it for 0-1V, the output current is 10% $I_r$ .
5. Do not connect the GND of dimming to the output; otherwise, the LED driver can not work normally.

## Mechanical Outline

### ESC-150SxxxDT



### ESC-150SxxxST



## RoHS Compliance

Our products comply with the European Directive 2002/95/EC, calling for the elimination of lead and other hazardous substances from electronic products.

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## Revision History

Change Date	Rev.	Description of Change		
		Item	From	To
2011-10-10	A	Datasheet Release	/	/
2011-10-11	B	Derating Curve, Life time PF, EFF Curve	/	Update
2011-10-19	C	Output Voltage at No Load $I_o = 700 \text{ mA}$ $I_o = 2800 \text{ mA}$	220 V 60 V	225 V 65 V
2011-12-28	D	Life Time	/	Update
2012-01-17	E	ESC-150S210ST(DT) added	/	New model added
2012-06-05	F	Notes of Life time	/	Updated
		Max Output Voltage of ESC-150S058DT	258 V	257 V
2012-7-17	G	Max Case Temperature	/	Updated
2012-7-30	H	Mechanical Outline-Wire diameter added	/	Updated
		Min PF be added in Input Specifications	/	/
2012-9-26	I	Life time curve	/	Updated -14W max
		MTBF, Life time Typical	/	Added
		Temperature coefficient	/	Added
		Inrush Current ( $I^2t$ )	/	Added